CENTER FOR NEURAL ENGINEERING

AT

TENNESSEE STATE UNIVERSITY

AASERT ANNUAL PROGRESS REPORT

Period: June 1,1994 to May 30,1995

Submitted to

Dr. Joel Davis

Program Officer, Computational Neuroscience

Cognitive and Neuroscience Division

Office of Naval Research

(Grant # N00014-93-1-0723)

By

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6. AUTHOR(S)

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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

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13. ABSTRACT (Maximum 200 words)

Three graduate students and one undergraduate student conducted research in the Center for Neural Engineering in the areas of biologically motivated neural networks. Their research topics are: 1) developing frequency dependent oscillatory neural networks; 2) long term pontentiation learning rules as applied to spatial navigation; 3) design and build a servo joint robotic arm and 4) neural network based prothesis control. One graduate student published a paper on "dynamic current-voltage characteristics in neuronal dendrites" in WCNN 95 conferences proceeding.

14. SUBJECT TERMS

Neural networks, oscillatory nerons, spatial navigation, prothesis control.

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REPORT ON AASERT GRANT

AASERT grant was awarded to Tennessee State University to provide research experiences to two graduate and one undergraduate minority U.S. citizen students in the area of biologically motivated neural networks. The students conducted research in the Center for Neural Engineering (CNE), funded by ONR and their progress is stated below:

1. Ms. Carolyn Keaton, a graduate student in the electrical and computer engineering department received B.S. (E.E.) degree from Morgan state University and joined TSU in Spring 1993 to pursue Master of Engineering degree. She gained research experience in Hippocampus based NN architecture modeling under the supervision of Dr. S. Chirawa at Mehhary Medical College (MMC). She spent summer 1994 in Professor Bowers laboratory at CalTech and gained some experience in use of Genesis . She is currently continuing her work under Dr. Geoffery Yuen, a post-doc research associate in CNE on developing frequency dependent oscillatory neural networks. The experimental data is provided by Dr. Tim Teyeler's laboratory at the North East Ohio Universities College of Medicine and is expected to graduate by December 1995.

2.. Mr. Jarvis Spruill, a graduate student in electrical and computer engineering department received B.S. (E.E.) degree from University of Memphis and joined TSU to pursue Master of Engineering degree. He also gained initial hippocampus experimental experience in Dr. Chirawa's laboratory. He is currently conducting research under Dr. Yuen on long term potentiation learning rules as applied to

spatial navigation. He is also receiving data from Dr. Teyler. Jarvis is expected to graduate in december 1995.

3. Vivian Dorsey currently a graduate student in the electrical and computer engineering department is a protege of CNE. She conducted research in the CNE as undergraduate student. She entered in the graduate program in Fall 1994 and is expected to graduate by August 1996.. Her research project is centered on designing and building a servo joint based robotic arm. Vivian is being supervised by Dr. Saleh Zein-Sabatto, Assistant Professor of Electrical and Computer Engineering Department.

4. Ms. Stephanie Smith, a senior in the electrical and computer engineering department conducted research at CNE under the guidance of Dr Mohamed Bodruzzaman on "Neural network based prothesis control". She completed her senior project and graduated with B.S.(E.E.) degree in May 1995. Stephanie is currently employed by Motorola in Scotsdale, Arizona.

Carolyn Keaton published a paper jointly with Dr. Yuen on "Dynamic current-voltage characteristics in neuronal dendrites" in WCNN'95 conference proceedings. Vivian Dorsey will publish a paper at IEEE'96 conference. She is a success story of AASERT in retaining minorities to pursue graduate studies in critical technology fields.

All four of them are minority U.S. citizens.

GRANT NUMBER: N00014-93-1-0723

FORM A2-2

AUGMENTATION AWARDS FOR SCIENCE & ENGINEERING RESEARCH TRAINING (AASERT) REPORTING FORM

The Department of Defense (DOD) requires certain information to evaluate the effectiveness of the AASERT program. By accepting this Grant Modification, which bestows the AASERT funds, the Grantee agrees to provide the information requested below to the Government's technical point of contact by each annual anniversary of the AASERT award date.

1. Grantee identification data: (R & T and Grant numbers found on Page 1 of Grant)

a. TENNESSEE STATE UNIVERSITY
University Name

b. N00016-93-1-0723
Grant Number

c. 4426206---03
R & T Number

d. Dr. Mohan J. Malkani
P.I. Name

e. From: June 1994 To: May 1995
AASERT Reporting Period

NOTE: Grant to which AASERT award is attached is referred to hereafter as "Parent Agreement."

2. Total funding of the Parent Agreement and the number of full-time equivalent graduate students (FTEGS) supported by the Parent Agreement during the 12-month period prior to the AASERT award date.

a. Funding: $ 1,323,264.00

b. Number FTEGS: 3

3. Total funding of the Parent Agreement and the number of FTEGS supported by the Parent Agreement during the current 12-month reporting period.

a. Funding: $ 1,323,264.00

b. Number FTEGS: 3+3 (UGS)

4. Total AASERT funding and the number of FTEGS and undergraduate students (UGS) supported by AASERT funds during the current 12-month reporting period.

a. Funding: $ 212,257.00

b. Number FTEGS: 2

c. Number UGS: 1

VERIFICATION STATEMENT: I hereby verify that all students supported by the AASERT award are U.S. citizens.

Principal Investigator

July 18, 1995
Date